II. Remarks

Support for the various amendments made to the claims herein may be found throughout the application as originally filed. No claims are cancelled herein, and no new claims are added herein. Claims 26-32 and 38-42 are amended herein. Claims 26-45 remain pending.

On June 21, 2007, an Office Action (hereafter "Office Action") was mailed rejecting all of the then-pending claims (*i.e.*, claims 26-45) on the basis of being anticipated by U.S. Patent No. 5,148,016 to Murakami.

This Response and Amendment is submitted in response to the Office Action.

III. Rejections of Claims Made in the Final Office Action

In the Office Action mailed June 21, 2007, the Examiner rejected claims on the following basis:

(1) Clams 26-45 were rejected under 35 U.S.C. Section 102(b) as being anticipated by U.S. Patent No. 5,148,016 to Murakami et al.

The foregoing rejection is responded to below.

IV. Responses to Rejections Made in the Final Office Action

(A) Claims 26-45 as amended herein are neither anticipated by nor obvious in view of U.S. Patent No. 5,148,016 to Murakami et al.

(1) The Murakami Reference

Pertinent portions of the Murakami reference, including those cited by the Examiner in the Office Action, include the following:

> ***The position of an object including a retroreflector is determined by scanning first and second optical beams toward an axis on a planar surface from spaced sites on opposite sides of the axis.*** The scanned beams are incident on and reflected from the retroreflector along coincident first and second paths between the sites and the retroreflector. Indications are derived of first and second angles between a baseline between the sites and the first and second paths extending between the sites and the retroreflector. In response to the known distance between the sites and the derived indications of the first and second angles a two-coordinate direction indication of the retroreflector position is derived. The retroreflector refracts and reflects the scanned optical beams incident thereon and refracts the beams reflected thereby. *[Emphasis added.] Abstract of U.S. Patent No. 5,148,016 to Murakami et al.*
>
> The present invention relates to an optical coordinate input apparatus and a position indicator thereof capable of inputting information about manuscripts, figures, precise drawings, and the like to a host apparatus. More particularly, the present invention relates to an optical coordinate input apparatus and a position indicator thereof which can be optionally applied to a subject two-dimensional coordinate plane and in which a region to which

indications of coordinates are substantially free from restrictions. *Col. 1, lines 13-22 of U.S. Patent No. 5,148,016 to Murakami et al.*

In order to achieve the first object, an optical coordinate input apparatus according to the present invention comprises: a reflection type position signaling device for deriving coordinate input data; the device is movably disposed over a two dimensional coordinate plane having a given size so that incident optical radiation passing along an optical passage which is toward a central axis of the plane is reflected, the reflected light passing inversely along the optical passage; an optical source disposed on the coordinate plane ***emits incident light that angularly scans along the coordinate plane from two points disposed away from each other on a reference line*** and capable of receiving light which inversely passes after the light has been reflected by the position indicator when the incident light coincides with the optical passage; and a calculating portion for calculating angles between the optical passages connecting the two points to a central axis of the position indicator and the reference line and further calculating the coordinate instructed by the position indicator by using thus calculated angles and a distance between the two points in accordance with a principle of triangulation.

According to the present invention, ***the reflection type position indicator is disposed on the two dimensional coordinate plane to derive an indication of the object coordinates. The optical source disposed on this coordinate plane emits optical beams from two spaced points on the reference line. The beams propagate toward the reflection type position indicator and are simultaneously angularly scanned.*** The incident beam propagating toward the central axis of the position indicator is reflected by the position indicator, causing the reflected light beam to propagate in the reverse direction. When the reflected beam propagates along the same path as the incidence beam back to the angular scanner, i.e., when the incident and reflected beams coincide, an output signal is derived. The angles between the optical paths and the reference lines are determined when the beams coincide are determined by a computer. The computer uses the thus obtained angles and the distance between the two spaced points to calculate the coordinates of the object in accordance with triangulation principles. *[Emphasis added.] Col. 2, lines 6-49 of U.S. Patent No. 5,148,016 to Murakami et al.*

To achieve the above-described second object, ***an optical coordinate input apparatus according to the present invention includes a pair of optical sources mounted on the coordinate plane for emitting incident beams that angularly scan along the coordinate plane from two spaced points along a reference line. The beams are reflected by the position indicator. When the incident and reflected paths coincide, signals are derived. The angular scanners are relatively moved along the reference line so that a distance between the two points are determined to correspond to the size of the coordinate plane.*** *[Emphasis added.] Col. 3, lines 13-24 of U.S. Patent No. 5,148,016 to Murakami et al.*

As illustrated in FIG. 1(b), laser light sources 121 and 122 respectively illuminate semi-transparent mirrors 123 and 124. ***The beams reflected from mirrors 123 and 124 are respectively incident on first and second rotary mirror 125 and 126, respectively driven by drives 131 and 132, while beams reflected from retroreflecting cursor 110 are respectively reflected from mirrors 125 and 126 to first and second photodetectors 127 and 128, after passing through semi-transparent mirrors 123 and 124.*** *[Emphasis added.] Col. 5, lines 65-68 and col. 6, lines 1-6 of U.S. Patent No. 5,148,016 to Murakami et al.*

Each of the laser light sources 121 and 122 comprises a semiconductor laser so that the laser beam emitted from the laser light source 121 is parallel to the plane XY. *Col. 6, lines 15-18 of U.S. Patent No. 5,148,016 to Murakami et al.*

The operation of the cursor according to the present invention is now described with reference to FIG. 1(b). First, the supporting member 5 for supporting cursor 110 is held on a predetermined plane XY and the central point P0 of the cursor is, by using cross hairs, made to coincide with a predetermined specific point having coordinates to be determined. *Col. 8, lines 49-55 of U.S. Patent No. 5,148,016 to Murakami et al.*

Register 151 is connected to respond to the output of counter 148 to latch output data from counter 148 in response to the leading edge of pulse signal E derived from pulse shaping circuit 145. Register 152 is connected to respond to the output of counter 149 to latch output data from counter 149 in response to the leading edge of pulse signal F derived from pulse shaping circuit 146. An input of tri-state register 153 is connected to the output of register 151 to latch output data from register 151 in response to a transition of interruption signal INT from logic "0" to logic "1." The input of tri-state register 154 is connected to the output of register 152 to latch output data from register 152 in response to a transition of interruption signal INT from logic "0" to logic "1."

CPU 155, connected to the outputs of registers 153 and 154 via data bus DB, responds to data stored in registers 153 and 154 when interruption signal INT has a logic "1" value. CPU 155 supplies a logic "1" reset pulse signal R to output port P1 after the above-described data have been received.

A laser beam angle detection means includes first and second rotary mirror drives 131 and 132, clock signal generating circuit 143, pulse shaping circuits 144 and 146, and counters 148 and 149. An arithmetic means for determining the cursor coordinates includes detection circuits 141 and 142, clock signal generating circuit 143, pulse shaping circuits 145 and 147, interruption signal generating circuit 150, registers 151 to 154, CPU 155, and a program (to be described later) for operating the CPU 155. *[Emphasis added.] Col. 9, lines 12-42 of U.S. Patent No. 5,148,016 to Murakami et al.*

The calculating portion 306 includes a CPU so as to calculate, similarly to the above-described embodiments, the coordinate instructed by the position indicator (cursor) 301 ***in accordance with the angular data θ_1 and θ_2 obtained similarly to those obtained according to the above-described embodiments and data L representing the distance between two points***, the data L being previously inputted. *[Emphasis added.] Col. 23, lines 6268 and col. 24, line 1 of U.S. Patent No. 5,148,016 to Murakami et al.*

Fig. 1b of the Murakami reference is reproduced hereinbelow.

FIG.1(b)

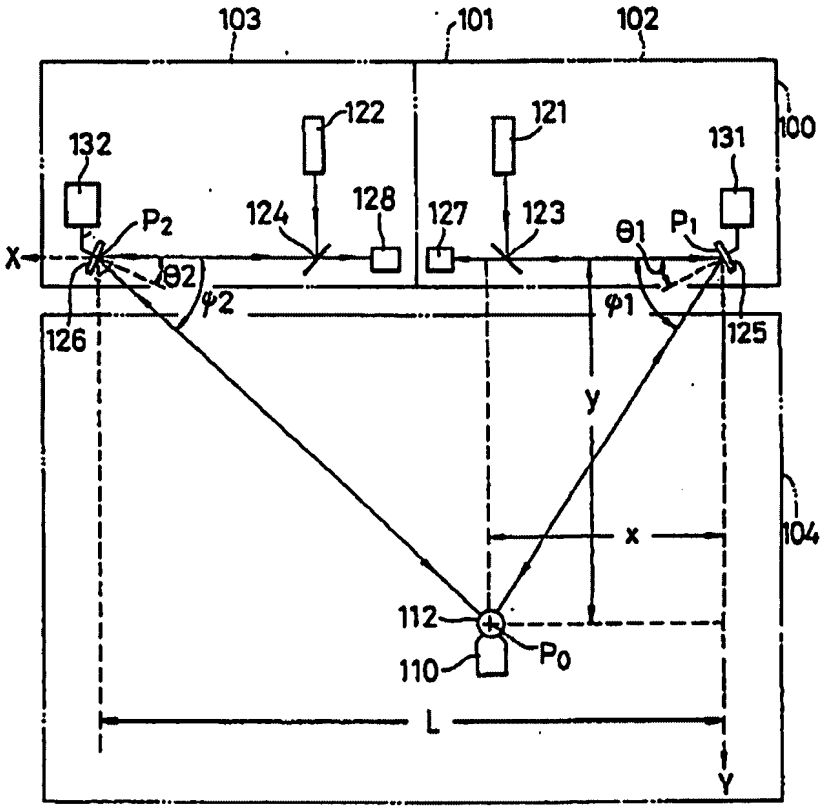

Fig. 1b of the Murakami Reference

(3) Discussion

In the Office Action, at the bottom of page 2, in support of the proposition that the Murakami reference teaches a first light beam being swept, respectively, over a first full angular range and a first limited angular range, the Examiner stated:

> ([T]he first full angular range in also a first limited range as shown in figure 1b);

Reference to Fig. 1b, however, shows angles θ_1 and θ_2, and angles ψ_1 and ψ_2, where $2(\theta_1) = \psi_1$ and $2(\theta_2) = \psi_2$. See also Figs. 9a and 9b, where those mathematical relationships between the angles are confirmed. As noted in Figs. 9a and 9b and in the specification of the Murakami reference, such angles are employed to compute the position of the retroreflector and have nothing whatsoever to do with the ranges of angles over which the first and second light beams are swept. Angles θ_1 and θ_2 do not denote limited sweep angles. Nor do angles ψ_1 and ψ_2 denote full sweep angles. The Examiner makes a similar statement on page 3 at line 12 regarding such angles, which is also erroneous for the same reasons. Figure 1b of the Murakami reference and the portions of the specification corresponding thereto clearly do not teach, suggest, hint or otherwise disclose anything concerning different angular ranges over which the first and second beams are swept in response to detecting, or not detecting, a target, or anything regarding dithering a light beam over a target once it has been detected to more precisely determine the target's position.

Similarly, in the Office Action at page 4, line 2, the Examiner cites Fig. 1b, the Abstract and col. 2, lines 25-49, in support of the proposition that the Murakami reference teaches "(a) the first light beam steering unit to sweep through the first full angular range until the target is detected as a result of the first target reflected beam being reflected into the first light detector; (b) the second light beam steering unit to sweep through the second full angular range until the target is detected by the second target reflected beam being reflected into the second light detector; (c) the first light beam steering device to sweep through the first limited angular range in response to the first target reflected beam being detected by the first light detector; and (d) the second light beam steering device to sweep through the second limited angular range in response to the second target reflected beam being detected by the second light detector."

Reference to the portions of the Murakami reference cited by the Examiner as purportedly disclosing the foregoing subject matter reveals that the Abstract of the Murakami reference teaches scanning first and second optical beams towards a retroreflector and determining the position of the retroreflector on the basis of triangulation techniques. Fig. 1b of the Murakami reference discloses essentially the same subject matter as the Abstract (along with angles θ_1 and θ_2, and angles ψ_1 and ψ_2 discussed in detail hereinabove). The cited portions of Fig. 2 of the Murakami reference merely echo what is taught in the Abstract and Fig. 1b, namely scanning two different light beams over a field of interest to locate and determine the position of a target by triangulation techniques. Once again, the Murakami reference is shown not to teach, suggest, hint or otherwise disclose anything concerning different angular ranges over

which the first and second beams are swept in response to detecting, or not detecting, a target, or anything regarding dithering a light beam over a target once it has been detected to more precisely determine the target's position.

Applicants respectfully point out that other assertions made by the Examiner in the Office Action respecting certain elements of the claims purportedly being disclosed in the Murakami reference are similarly revealed to have no basis in fact. For example, the elements and limitations recited in claims 27, 28, 29-30 and 39-40, 31 and 41, and 32 and 42 as presented in the RCE and Preliminary Amendment and Response dated April, are simply nowhere to be found in the portions of the Murakami reference cited by the Examiner. In the event that the Examiner continues to assert that such elements and limitations are indeed disclosed in the Murakami reference, Applicants respectfully request that the Examiner point out with particularity where precisely such elements and limitations are to be found within the Murakami reference. Reference to claims 26-45 as amended herein will show that those claims contain many limitations disclosed nowhere in the cited Murakami reference. A rejection based on anticipation under 35 U.S.C. §102 requires that all elements recited in the rejected claims be found within the four corners of the cited reference. Claims 26 through 45 as amended herein easily overcome the Section 102 rejections made by the Examiner, as the Murakami reference is clearly missing multiple elements recited in the claims as amended herein.

Reference to the Murakami reference shows that it discloses an optical tracking system containing conventional moveable light sources configured to scan along a predetermined reference line or through a predetermined coordinate area. There is no disclosure, hint at, or suggestion to control the scanning of light sources in an optical tracking system in the manner recited in claims 26-45 as amended herein, where multiple light sources are scanned over variable angular ranges in a certain sequence and according to whether or not the target has been detected. Further perusal of the Murakami reference reveals that the following statements are made therein regarding scanning control of the moveable light sources disclosed therein:

> To achieve the above-described second object, an optical coordinate input apparatus according to the present invention includes ***a pair of optical sources mounted on the coordinate plane for emitting incident beams that angularly scan along the coordinate plane from two spaced points along a reference line.*** The beams are reflected by the position indicator. When the incident and reflected paths coincide, signals are derived. The angular scanners are relatively moved along the reference line so that a distance between the two points are determined to correspond to the size of the coordinate plane.
>
> According to the thus constituted coordinate input apparatus, ***a pair of optical source units including the angular scanners are moved relative to each other along the reference line in accordance with the area of the coordinate input region.*** As a result, an excellent optical coordinate input apparatus for various usages can be provided since coordinates can be determined over any optional sized coordinate input regions. *[Emphasis added] Col. 3, lines 13-33 of U.S. Patent No. 5,148,016 to Murakami et al.*

> FIG. 7 is a block diagram of an electric circuit for use in the second embodiment. Referring to FIG. 7, reference numeral 243 represents a first rotary mirror drive portion ***capable of counterclockwise rotating the first rotary mirror 241 shown in FIG. 5 at uniform angular velocity ω. . . . Reference numeral 244 represents a second rotary mirror drive portion capable of rotating the second rotary mirror 242 shown in FIG. 5 clockwise at uniform angular velocity Ω.*** *[Emphasis added] Col. 14, lines 14-32 of U.S. Patent No. 5,148,016 to Murakami et al.*
>
> According to the embodiment of FIG. 10, although rotary mirrors each of which has a mirror surface are employed as the first and second rotary mirrors 125 and 126, rotary mirrors each of which has a plurality of mirror surfaces may be employed. ***In this case, more accurate coordinate indications can be obtained since the intervals of the detections of the coordinates can be reduced by conducting calculations arranged to correspond to the polygon mirrors.*** *[Emphasis added] Col. 22, lines 60-68 of U.S. Patent No. 5,148,016 to Murakami et al.*
>
> Then, the pair of the light source units 304 and 305 are operated so as to ***angularly scan the incident line*** and calculate the coordinate P0 (x, y) by triangulation principles. *[Emphasis added] Col. 24, lines 33-36 of U.S. Patent No. 5,148,016 to Murakami et al.*

Thus, it will now be seen that nowhere does Murakami disclose multiple elements or steps recited in claims 26-45 ads amended herein. Instead, Murakami discloses a conventional optical tracking system where light beams are scanned continuously along a predetermined reference line or through a predetermined coordinate area at constant angular velocities ω and Ω. To increase the spatial resolution of target detection, Murakami states that multi-faceted mirrors may be employed on rotary mirrors, thereby teaching directly away from the presently claimed invention.

The Applicants have discovered that a certain novel combination of electrical, optical and electronic components combined and configured in a certain order are required to produce the beneficial effects of the present invention. As demonstrated above, at least six of those components and configurations are disclosed or suggested anywhere in the Murakami reference, and accordingly cannot be *prima facie* obvious.

Merely asserting that "would be obvious to try" the invention by making reference to the conventional optical tracking system of Murakami, while essentially creating other claimed elements out of whole cloth without referring to any specific portions of the cited references to establish a motivation for combining elements or functionality disclosed therein, would not establish a *prima facie* case of obviousness. In going from the prior art to the claimed invention, one cannot base obviousness on what a person skilled in the art might try or find obvious to *try*, but rather must consider what the prior art would have lead a person skilled in the art to *do*.

There is no incentive, teaching or suggestion in the Murakami reference to produce the invention now recited in claims 26-45 as amended herein. The mere fact that the cited Murakami reference could, with the benefit of hindsight, produce something vaguely similar to the present invention does not make the modification obvious, or suggest the desirability of the modification required to arrive at the present invention. Indeed, this conclusion is buttressed by the fact that numerous elements and limitations are missing in Murakami reference in respect of claims 26-45 as amended herein (as discussed in detail above).

It is well settled that a motivation to combine elements or limitations disclosed in disparate references *must be found within the references themselves or from pertinent sources of information,* and that such a motivation does not arise, as here, by merely identifying a collection of disparate piece parts in a combination of references, and then asserting it would have been obvious to take such disparate elements and limitations and add many others thereto to arrive at the presently claimed invention.

There is no suggestion of what direction any experimentation should follow in the Murakami reference to obtain the invention recited in claims 26-45 as amended herein. Accordingly, the result effective variables, for example controlling each of the light beam steering devices to scan through full and limited angular ranges according to whether or not a target has been detected, are not known to be result effective. Thousands or millions of attempts at variations might be made before arriving at the desired improvement. Thus, to say that it would be obvious to read the Murakami reference and somehow arrive at the invention recited in claims 26-45 as amended herein would clearly not be the test for obviousness.

The foregoing analysis also makes it clear that there is no basis in the art for modifying the teachings of the Murakami reference to arrive at the invention recited in claims 26-45 as amended herein. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.

When, as here, the prior art itself provides no apparent reason for one of ordinary skill in the art to make a modification or to combine references, an argument clearly does not exist that the claimed subject matter would have been obvious. Thus, an attempt to use the applicants' own disclosure as a blueprint to reconstruct in hindsight the invention now recited in claim as amended herein out of isolated teachings appearing in the prior art would clearly be improper.

The results and advantages produced by the invention set forth in claims 26-45 as amended herein, and of which the cited Murakami reference is devoid, cannot be ignored simply because the claim limitations might be deemed similar to the otherwise barren prior art.

The foregoing analysis also makes it clear that many limitations appearing in claims 26-45 as amended herein are not present in the Murakami references (as discussed in detail above). When evaluating a claim for determining obviousness, *all* limitations of the claim must be evaluated. Under §103, the Examiner cannot in turn dissect claims 26-45 as presented herein, excise the various individual elements recited in the claims, and then declare the remaining portions of the mutilated claims to be unpatentable. The Examiner must follow the basic rule of claim interpretation of reading the claims as a whole. Accordingly, the Murakami reference may not properly be use as a basis for rejecting claims 26-45 as amended herein under §103.

Finally, the function, way and result provided by the devices and methods disclosed in the Murakami reference are completely different from those provided by the presently claimed invention. The devices disclosed in the Murakami reference require that moveable light sources scan continuously at a constant angular speed over predetermined reference lines or coordinate areas to detect a target, and there is no teaching of the use of multiple scan angular ranges to better define the position of a target. Thus, the devices and configurations employed in the Murakami reference, and the results provided by such devices and configurations, are quite different from those provided by the presently claimed invention. Such opposing functions, ways and results establish yet further that the presently-claimed invention is not *prima facie* obvious in view of the Murakami reference.

For all the foregoing reasons and more, the presently claimed invention is not *prima facie* obvious in view of the Murakami reference.

V. Summary

Claims 26-45 as amended herein are pending in the present application and believed to be in condition for allowance. Examination of the application as amended is requested. The Examiner is respectfully requested to contact the undersigned by telephone or e-mail with any questions or comments he may have.

Respectfully submitted,
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By his attorney

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Date: 9-21-07

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